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great benefits have already been derived by the community at large from the two services acting in unison. It is further stated in regard to marine meteorology that the navy can now be kept conversant with the latest information touching upon this important subject, the serious study of which had been neglected by the department for many years. One of the reforms of the office has been the establishing on a permanent footing of this division, where the collection and dissemination of data could be carried on without interruption, and where instructions for the service could be prepared and revised in accordance with the progress of the science of meteorology. It is suggested that the Navy Department should establish stations throughout the West Indies, and, in co-operation with the Signal Service, bring the subject of West Indian hurricane warnings to a greater degree of perfection.

The policy of the office in encouraging its employees to improve the character of their work, either by the invention of apparatus or in the preparation of original matter in manuscript, has shown remarkably good results, as have also the efforts made to improve the chart service to ships of war. It is concisely pointed out where improvements can be made in this latter feature, and recommendations are submitted that are well calculated to secure in the near future a still better service. It is also hoped that with the increase in the number of charts, and the augmentation of our foreign commerce, the revenue derived from the increased sale of charts will finally result in making the office self-supporting.

Considerable attention is paid to the subject of the international marine conference, and to the collection by the branch offices of material of value placed before the United States delegates for their consideration; and it is confidently believed that the publicity given to the subject of floating wrecks, fogs, ice, safe routes, and so forth, by the monthly "Pilot Charts" and by the branch offices, has had an important bearing upon the bringing-together of the delegates forming the conference. At the same time full credit is given to Mr. Francis Houghton, superintendent of the Maritime Exchange of New York, to whose active and efficient management is mainly due the passage of the act of Congress creating the conference.

It is suggested that all naval surveying work be under the immediate supervision of the Hydrographic Office, as it is thought that greater economy is possible by such an arrangement, and that the requisite degree of efficiency can only be attained by uniting all the functions of a surveying office with those that the Hydrographic Office possesses at present. A surveying branch being considered a necessary part of the naval establishment, it is thought that special inducements must be held out to officers who are willing to take up this work; and it is hoped that the days for perfunctory service in the Hydrographic Office have departed.

The system of branch offices having proved its great value to the maritime community, its extension is recommended to include every shipping port of importance on our coasts. It is thought by so doing that the Navy Department can maintain itself as the natural leader in all subjects of a hydrographic nature, to which the best interest of the government and the technical education of its officers clearly entitle it.

It is recommended to erect a separate and specially constructed building for the use of the office, the necessity of having commodious and well-lighted rooms for draughtsmen and engravers being obvious. Series of charts for China and the East, a pilot chart for the Pacific, and permanent parties for the determination of the earth's magnetism, together with more extended surveys of those portions of the world in which our trade is active and growing, are all points well worthy of the enacting clause of Congress.

BOOK-REVIEWS.

Hygiene and Public Health. By LOUIS C. PARKES, M.D. Philadelphia, Blakiston. 12°. \$2.50.

DR. PARKES comes before us indorsed as the assistant professor of hygiene and public health at University College, London; and he assures us that it is as a result of his experience as a teacher at that institution that he was led to believe that a small book, clearly written, on hygiene, would serve a good purpose. The author has aimed to cover the whole field of sanitary science, and

has given such elementary information on every topic as will enable the reader to refer with advantage to the larger text-books.

The necessity under which health-officers often find themselves of dealing with figures and statistics has induced Dr. Parkes to introduce as a closing chapter a discussion of statistics, and how to handle them in so far as they are likely to be of value to those whom he aims to assist. Medical men find trouble in this mathematical part of their work, and will be interested in this novel chapter.

As good drainage is all-important for the preservation of public health, we find Dr. Parkes has devoted considerable space to the methods of disposal of refuse.

The opening chapter is, however, on water. It is one of the longest, and is written with the good judgment displayed throughout the book.

The other chapters are on ventilation, warming and lighting, climate (in which it is possible undue attention is given occasionally to matters which might be assumed as known), soils and building-sites (a chapter likely to interest many), exercise, and contagion. Throughout, the book is written so as to be interesting and intelligible to laymen and doctors alike, and we take pleasure in calling attention to it.

Alternate-Current Machinery. By GIBBERT KAPP. New York, Van Nostrand. 24°. 50 cents.

THIS timely little volume had its origin in a paper read before the Institute of Civil Engineers, London, by Mr. Kapp, whose name and reputation as an electrician are well known to all interested in the progress of electrical science. It is reprinted, in convenient pocket form, from the minutes of the proceedings of the society before which it was read, and contains, besides Mr. Kapp's paper, the comments and criticisms made upon it by many eminent electricians, members of the institute, and Mr. Kapp's replies and explanations. The book appears at an opportune moment, as the matter it contains derives additional interest from the fact that the sharp competition at present existing between advocates of the direct-current and those of the alternate-current systems of electric lighting is compelling closer attention to all that is published concerning both systems, or groups of systems.

The subject comprised under the title of the work is divided by the author into six sub-sections: 1. Alternators; 2. Transformers; 3. Motors; 4. Meters; 5. Mains; 6. Accessory apparatus for use in central stations and on the premises of the persons supplied with current from such stations. The question of lamps Mr. Kapp considers as somewhat foreign to the subject under consideration, as glow, or incandescent, lamps are equally suitable to be fed by alternating and direct currents, and arc lamps are adapted to either current by changes easily made. Alternators, transformers, and motors, — the three main points, — of course receive more attention from Mr. Kapp than the subsidiary ones, though no point has been left far in the background.

A Handbook of Descriptive and Practical Astronomy. I. The Sun, Planets, and Comets. By GEORGE F. CHAMBERS. 4th ed. Oxford, Clarendon Press. 8°. \$3.

NEARLY thirty years ago Mr. Chambers had ready the first edition of this handbook, which was designed as a handbook that should be attractive to the general reader and of occasional service to the professional astronomer. The author aimed to make a book that should be popular without being vapid, and scientific without being unduly technical. That he was reasonably successful we all know.

A second edition followed in 1861, and a third in 1876. And it should be called to mind that this was the work of an English barrister, who could spare for his hobby, as it were, but a part of his time, mainly absorbed by his professional engagements.

The volume we have before us is the first volume of the fourth edition. The plan at first was to break the work up into two volumes, but the material proved so large in amount that three were finally decided upon; and the author finds himself in a position where he can carry out his original conception of what such a treatise should be.

In this volume we have the descriptive astronomy of the sun,

planets, and comets; the second, to be issued at an early date, will contain an account of astronomical instruments and practical astronomy; and the third will be devoted to the starry heavens. Each volume will have its own index, and will be sold, as it in truth will be, as a distinct book, though of course forming part of the series of three.

Of speculation there is little to be found within the covers. If one looks for discussion of the possibility of life on any of the planets aside from the earth, he is likely to be disappointed. But the book is full of straightforward statements of the facts so far as we know them, and it may be said that it is well brought up to date.

Chambers's Encyclopædia. New edition. Vol. IV. Dionysius to Friction. Philadelphia, Lippincott. 8°. \$3.

THIS volume contains a goodly number of articles of specially scientific interest. The list of American contributors is not large, nor is it to be expected that it should be. Oliver Wendell Holmes, perhaps, leads in importance in this list with an article on Emerson. The others by Americans are on local geographical matters and on Ben Franklin.

It is perhaps unnecessary to call attention again to the purpose of this encyclopædia, which gives authoritative matter well condensed in its short articles, which often come down to a single paragraph; yet many ask which is the best of the encyclopædias, and show that they are not acquainted with the characteristics of those offered.

In this volume we have short articles, devoid of all technicalities, on dynamos, electric light and railway, by Professor J. A. Ewing; earthquake, by Professor James Geikie; electricity, by Professor C. G. Knott; evolution, by Professor Patrick Geddes; exhibitions, by H. Roscoe Dumville; force, by Professor Tait. But we could fill a page with a list like this.

There are eight colored maps in the volume, — one of the District of Columbia, another of Florida, the others being devoted to Europe, England, and France. A colored plate shows the flags of all nations.

There is as much space given to electricity as to any other subject in the volume, the article sketching the phenomena of electrification, electric currents, and resistance, and the resulting electrolysis and thermo-electric effects. We do not find any reference to the lately developed Hertz effects, which were probably published too recently for insertion. The limitations in the scope of this main article are atoned for in the adjunct articles on atmospheric and medical electricity, electric fishes, electric light, railways, electro-metallurgy, and others to the number of a dozen or more.

The article on exhibitions is naturally examined at this time, and it is somewhat amusing to find the Paris exhibition of this year referred to in the past tense; which shows, however, a due amount of care in bringing the matter up to date.

Hints to Travellers, Scientific and General. Edited for the Council of the Royal Geographical Society by DOUGLAS W. FRESHFIELD and Capt. W. J. L. WHARTON. 6th ed. London, The Royal Geographical Society. 24°.

THESE "Hints to Travellers" had their origin in a report made to the council of the Royal Geographical Society as long ago as 1854. This report was drawn up by Admiral Fitzroy and Lieut. Raper of the Royal Navy, and aimed to answer the numerous queries addressed to the society as to the proper instrumental outfit for explorers.

This report, to which were added some suggestions by Admirals Smyth and Beechey, Col. Sykes, and Mr. Francis Galton, was published in the journal of the society, and republished in pamphlet form.

The exhaustion of this first edition led, in 1864, to a revision, in which Sir George Back, Admiral Collinson, and Mr. Galton, assisted; chapters on photography by Dr. Pole, and collection of objects in natural history by Mr. Bates, being added.

The editions of 1871, 1878, and the fifth, the date of which we do not now recall, followed. In each some wise development of the original plan, without any undue increase in the bulk of the volume, has taken place. The second edition was designed to

help a person proposing to explore some wild country, who would know what astronomical and other scientific outfit he ought to take with him, and what observations he might attempt, with a prospect of obtaining valuable results. In the fifth edition one object was to furnish such help as might be possible within the compass of a pocket-book to the explorer who had acquainted himself with the use of instruments, that he might win the more valuable geographical results during his wanderings. Geology and anthropology were added subjects, to which some attention was paid, and some medical and surgical information were introduced from the pen of Surgeon-Major Dobson.

The present editors have not attempted any change in the character of the book, the previous alterations and additions having met with general approval. Capt. Abbey has brought up to date the photography, and the meteorology has been revised by Mr. H. F. Blanford. Mr. J. S. Keltie has something to say on commercial geography.

Coal and the Coal Mines. By HOMER GREENE. Boston and New York, Houghton, Mifflin, & Co. 24°. 75 cents.

THIS is one of the Riverside Library for Young People. The object of this series is to furnish books which shall contain reliable information written in language likely to be intelligible and attractive to young people without a descent to "childese." This special number is not so long as to be likely to weary a young person attempting to read it, and it is published at a low price; so that it is the more likely to fall into the hands of those for whom it is intended.

Young folks are not young folks long; and each of us, as he has passed through that stage, has needed, among other things, the books suited to a year, or at most two or three years, then to be thrown aside for others. So in "Coal and the Coal Mines" the publishers have made no attempt to show the capabilities of their art, except in making a book that opens well, and is clearly printed. Every feature is in good taste, but there is no evidence of lavishness in wide margins and heavy calendered paper. It is an attractive and serviceable book for the use it is to have.

We say "it is to have," for we judge that "Coal and the Coal Mines" is sure to have a good many readers, — young readers, and very likely old ones. There is to be found within the covers a straightforward statement of how coal was discovered, how it was found that it could be used to best advantage, and how, when at last it was needed for use in large amounts, ingenuity was set at work to get the coal from the earth.

All this could be told so that little human interest should exist in the telling. But Mr. Greene has lived among the miners; and he carries his reader with the miner down to his hazardous work, letting him know wherein it is hazardous and wherein alluring, and carries him through to the end of a day of profit, or possibly of destruction. Some of the tales he has to tell are intensely exciting, and make one look on a shovelful of coals with a feeling of interest in the human skill and courage that have placed them at our disposal, and wonder whether we are quite justified in throwing them heedlessly on the fire.

Yes, we think those who take up "Coal and the Coal Mines" will finish it, and that they will be the better-informed men or women, boys or girls, for the reading of it.

AMONG THE PUBLISHERS.

THE Worthington Company will publish on Nov. 1 "A Study of Ben Jonson," by Algernon Charles Swinburne.

— De Wolfe, Fiske, & Co. have ready "Essentials of the Metric System," by George Jackson, with explanation of its principles, and examples for practice.

— The Writers' Publishing Company, New York, have just issued "A Directory of Catholic Colleges, Academies, and Leading Schools in the United States for 1889 and 1890."

— J. W. Bouton is soliciting subscriptions for the "Salon of Paris" for 1889. Like its predecessors, it will illustrate the principal works by the photogravure process, one hundred plates being promised in various colors, and the majority of them full-page.